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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/517,922	12/14/2004	Antonius Adrianus Cornelis Maria Kalker	NL 020572	8880

24737 7590 06/02/2008
PHILIPS INTELLECTUAL PROPERTY & STANDARDS
P.O. BOX 3001
BRIARCLIFF MANOR, NY 10510

EXAMINER	
BEKELE, MEKONEN T	
ART UNIT	PAPER NUMBER
2624	
MAIL DATE	DELIVERY MODE
06/02/2008	PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No.	Applicant(s)	
	10/517,922	KALKER ET AL.	
	Examiner	Art Unit	
	MEKONEN BEKELE	4142	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE *3* MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *17 March 2008*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-20* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-11* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☒ Claim(s) *12-20* are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *14 December 2004* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☒ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

1. Claims 1-20 are pending in this application.

2. Claims 6, 7, 10 and 11 are amended

3. Claims 12—20 are new.

Priority

4. Applicants' claim for foreign priority under 35U.S.C 119(e) is acknowledge based on the foreign application PCT/IB03/02569 filed on 06/17/2002.

Drawings

5. The drawings are filed on 12/14/2004 are accepted for examination.

Election/ restriction

6. Restriction to newly submitted claims 12-20 is required under 35.U.S.C 121.

I Claim 1-11are drawn to a method of embedding auxiliary data in a host signal, the method comprising the steps of: using a predetermined data embedding method having a given embedding rate and distortion to produce a composite signal classified in class 382, sub class 100

II. Newly submitted claims 12-20 are drawn to a method of receiving content data, and embedding auxiliary data and reconstruction data into segments of the content data by modifying symbols of the segments classified in class 382, sub class 287

Inventions 1 and 2 are related as combination and subcombination. Inventions in this relationship are distinct if it can be shown that (1) the combination as claimed does not require the particulars of the subcombination as claimed for patentability, and (2) that the subcombination has utility by itself or in other combinations (MPEP § 806.05(c)). In the instant

case, the combination as claimed does not require the particulars of the subcombination as claimed because the method embeds a data in a host sign signal using a predetermined data embedding method having a given embedding rate. The subcombination has separate utility such as method of embedding auxiliary data and reconstruction data into segments of the content data by modifying symbols of the segments

Newly submitted claims 12-20 directed to an invention that is independent or distinct from the invention originally claimed for the following reasons: The newly added calms has separate utility such as method of embedding auxiliary data and reconstruction data into segments of the content data by modifying symbols of the segments

Since applicant has received an action on the merits for the originally presented invention, this invention has been constructively elected by original presentation for prosecution on the merits. Accordingly, claims 12-20 withdrawn from consideration as being directed to a non-elected invention. See 37 CFR 1.142(b) and MPEP § 821.03.

Claim Rejections - 35 USC § 101

35 U.S.C. 101 reads as follows:

> Whoever invents or discovers any new and useful process, machine, manufacture, or composition of matter, or any new and useful improvement thereof, may obtain a patent therefor, subject to the conditions and requirements of this title.

The USPTO "Interim Guidelines for Examination of Patent Applications for Patent Subject Matter Eligibility" (Official Gazette notice of 22 November 2005), Annex IV, reads as follows:

> In contrast, a claimed computer-readable medium encoded with a computer program is a computer element which defines structural and functional interrelationships between the computer program and the rest of the computer which permit the computer program's functionality to be realized, and is thus statutory. See Lowry, 32 F.3d at 1583-84, 32 USPQ2d at 1035.
>
> Claims that recite nothing but the physical characteristics of a form of energy, such as a frequency, voltage, or the strength of a magnetic field, define energy or magnetism, per se, and as such are nonstatutory natural phenomena. O'Reilly, 56 U.S. (15 How.) at 112-14. Moreover, it does not appear that a claim reciting a signal encoded with functional descriptive material falls within any of the categories of patentable subject matter set forth in Sec. 101.
>
> ... a signal does not fall within one of the four statutory classes of Sec. 101.
>
> ... signal claims are ineligible for patent protection because they do not fall within any of the four statutory classes of Sec. 101.

7. Claim 11, is rejected under 35 U.S.C. 101 because the claimed invention is directed to non-statutory subject matter as follows. Claim 11 is drawn to functional descriptive material recorded on a **computer-readable medium**. Normally, the claim would be statutory. However, the specification, **does not** defines or exemplifies the claimed computer readable medium as encompassing statutory media such as a "ROM", "hard drive", "optical drive", etc, as well as ***non-statutory*** subject mater such as "a composite signal and host signal ".

"A transitory, propagating signal is not a "process, machine, manufacture, or composition of matter." Those four categories define the explicit scope and reach of subject matter patentable under 35 U.S.C. § 101; thus, such a signal cannot be patentable subject matter." (*In re Petrus A.C.M. Nuijten;* Fed Cir, 2006-1371, 9/20/2007).

Because the full scope of the claim as properly read in light of the disclosure appears to encompass non-statutory subject matter (i.e., because the specification defines/exemplifies a computer readable medium as a non-statutory signal, carrier waver, etc.) the claim as a whole is non-statutory. The examiner suggests amending the claim to ***include*** the disclosed tangible computer readable storage media, while at the same time ***excluding*** the intangible transitory media such as signals, carrier waves, etc Any amendment to the claim should be commensurate with its corresponding disclosure

Claim Rejections - 35 USC § 112

The following is a quotation of the first paragraph of **35 USC § 112**

> The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same, and shall set forth the best mode contemplated by the inventor of carrying out his invention.

8. Claim 11 rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the enablement requirement. The claim(s) contains subject matter which was not described in the specification in such a way as to enable one skilled in the art to which it pertains, or with which it is most nearly connected, to make and/or use the invention. The claim 11 contains the term **computer readable medium** which was not described in the specification.

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35U.S.C.102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless -
>
> (b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

9. Claims 1 and 6 are rejected under 35 U.S.C. 102(b) as being anticipated by Brain Chen [hereafter Chen]. "Design and Analysis of Digital Watermarking Information Embedding, and Data Hiding System", Ph. D Thesis, Massachusetts Institute of Technology, June 2000

10. As to claims 1 and 6 Chen teaches A method (**page 29-32, embedding methods and System**) of embedding auxiliary data (**Abstract: embedding information some times called watermark**) in a host signal (Abstract), the method comprising the steps of:

using a predetermined data embedding method (**Abstract: quantization index modulation embedding method and the LBM modulation embedding method, see thesis summary page 20 section 1.2**) having a given embedding rate (**page 24. section 2.1 lines 6-8, embed at of rate of Rm bits per hot signal, the** embedding rate **corresponds to embedding rate Rm)** and distortion (**page 24. section 2.1 lines 19-22: see equation 2.2**) to produce a composite signal (**page 23 Fig. 2.1 see composite signal S**)

using a portion of said embedding rate (**page 20 section 1.2 lines 6-7, the LBM modulation embedding system has two steps: the first step extracting the least significant bit(s),LSB, from the host signal and compress, and the second step is embed the massage into the compressed part of the host signal,** thus the portion of the embedding rate **corresponds to the embedding rate used during the extraction and compressing process**) to accommodate restoration data (**page 20 section 1.2 lines 6-7, extracting the LSB from the host signal and compress it in order to embed the message signal in to the host signal,** restoration data corresponds to **the compressed data**) identifying the host signal conditioned (**section 1.2 lines 6-7 and lines 16-18, identifying distortion of the host signal caused by the extraction and compression process**) on said composite signal

using the remaining embedding rate (**the LBM modulation embedding system has two steps as mentioned above, where the second step is embed the massage into the compressed part of the host signal,** thus the remaining embedding rate **corresponds to the embedding rate used during the embedding process of a message in to the compressed part of the host signal)**

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

> (e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

11. Claims 7-11 are rejected under 35 U.S.C 102(e) as being anticipated by Fredrich et al. [hereafter Fredrich], US Patent No. 7,006,656 B2 filed on Oct. 15, 2001

12. As to claims 7 and 10, Fridrich teaches A method of reconstructing a host signal (**Fig.1: Extraction section, abstract, col.13 lines13-35, step 1-5, a method of data extraction and recovery of the original image,** reconstructing a host signal **corresponds to recovery of the original image**) from a composite signal (**Stego image)** representing a distorted version of said host signal (**Fig.1: Embedding part, the extracted and compressed part of the image which is the output of the Compress RS-vector,)** with data embedded there (**Fig.1: Embedding part, with the message bits embedded by means of Flip Groups block**), the method comprising the steps of (**col.13 lines 14-30 see steps 1 through 5**)

retrieving the embedded data (**Fig. 1 Extraction part, col. 13 lines 25-30 step 4, the Extract Groups block extract the compressed bit stream from Stego Image,** embedded data **corresponds to the compressed bit stream which is the out put of Extract Groups block)** from the composite signal **(Stego Image)**

splitting the embedded data into restoration data and auxiliary data,(**Fig. 1: Extraction section, col. 13 lines 30-35 step 5, the Decompress RS- vector block split the compressed bit stream into a Message bits and LSB of the host signal,** auxiliary data **corresponds to the a Message bits,** restoration data **corresponds to LSB of the host signal),**

the restoration data identifying distorted symbols in the distorted version of the host signal; (**Fig. 1 section 2 ,the input of the Uniflip Groups block content the distortion version of host signal)**

reconstructing the host signal using the reconstruction data, given the composite signal (**Fig.1 section 2, col. 13 lines 13-35; step1- step 5, follow step1 through step 5 to reconstruct the original image from the Stego Image)**

13. **Regarding Claim 10,** Fridrich teaches means for retrieving… (**Fig.1: Extracting part, col.4 lines 11-20, the Extract Groups block and the Computer RS-vector block retrieve the embedded data from the Stego Image,** means for retrieving **corresponds to the Extract Groups block and the Compute RS-Vector block**

splitting means (**Fig.1: Extracting part, col.4 lines 10-20, the Decompress RS- vector block extract the message bits by Splitting,** means for splitting **corresponds to the Decompress RS- vector block,**)

Reconstruction means (**Fig.1 Extraction section, col.4 lines 10-20, the Unflip Groups block** reconstruction the original image, Reconstruction means **corresponds to the Unflip Groups block .**)

14. As to claim 8, Fridrich teaches dividing the composite signal into successive segments (**col.13 lines 14-15, see step 1**)

using the restoration data accommodated in a segment for reconstructing a previous segment of the host signal (**col. 13 lines 14-30, follow step 1 through 4**)

15. As to claim 9, Fridrich teaches each segment of the composite signal comprises the restoration data for said previous segment of the host signal as well as auxiliary data,**(Fig. 1: Embedding part, the out put of Fig.1: Embedding part (or the input of Fig. 1 extraction part) the Stego Image contents both the compress the LSB of the host image and the**

Message bit , composite signal **corresponds to the Stego Image,** restoration data **corresponds to compress the LSB of the host data,** auxiliary data **corresponds to Message bit.**

16. As to claim 11, Fridrich teaches computer readable medium (**col. 4 lines 45-46),** that includes a composite signal(col. 4 lines 55-56, composite signal corresponds to **the transformed object)**that **includes a host signal (col. 4 lines 46-48,** host signal corresponds **to digital object**) with distortion (**distortion of the digital object due to compression**), and embedded data (**col. 4 lines 46-451, a message plus the first sub set loosely compressed data**) comprising restoration data(**sub set loosely compressed**) and auxiliary data (**a message**), said restoration data identifying the distortion of the host signal(**Distortion due to compression**) conditioned on said composite signal.

Claim Rejections - 35 USC § 103

The following is a quotation of the 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained thought the invention is not identically disclosed or described as set forth in section 102 of this title, if the difference between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

17. Claims 2-5 are rejected under 35 U.S.C 103(a) as being unpatentable over Brain Chen [hereafter Chen]. "Design and Analysis of Digital Watermarking Information Embedding, and Data Hiding System", Ph. D Thesis, Massachusetts Institute of Technology, June 2000, in view of Fredrich et al. [hereafter Fredrich], US Patent No. 7,006,656 B2 filed on Oct. 15, 2001

18. As to claim 2, Chen teaches dividing the host signal (**page.58 section 5.1 line10**) into successive segments (**page.58 section 5.1 lines 9-12,** successive segments **corresponds to non- overlapping blocks of length L**)

applying the predetermined data embedding method to said segments (**page 59. section 5.1, Fig. 5-1)**

However it is noted that Chan doesn't specifically teaches accommodating in a segment the restoration data for a previous segment;

On the other hand Fridrich teaches accommodating in a segment (**Fig.1: Embedding part, col. 11 lines 60-65, dividing the image into disjoint blocks**) the restoration data (**page 188 Fig.1, the output of the Compress RS- vector block corresponds to** the restoration data) for a previous segment (**Fig.1: Embedding part col. 11 lines 60-66, output of compress RS is divided into B disjoint blocks ,where B is a total number of blocks, arranged in sequence, thus each blocks are compressed in non overlapping sequence before embedding the message,** the previous segment **corresponds to the k^{th} block, k= 1, 2, 3…B)**

One of ordinary skill in the art at the time the applicant's invention was made to incorporate the lossless embedding of data in digital objects of Fridric into the design and analysis of digital watermarking Information embedding, and data hiding system of Chen, because that would have allowed user of Chen allows to embed a large payload in a digital object in a lossless (i.e., invertible) manner so that, after the payload bits are extracted, the object can be restored to the form it had originally, before embedding. Further user of Chen allows to use all image formats and to any other object that comprises digital samples, such as an audio file. (col.5 lines 20-25)

19. As to claim 3 Fridrich teaches each segment comprises the restoration data for said previous segment as well as auxiliary data (**Fig.1: Embedding part, the output of Flip Groups block ,stego, images, continue both restoration data and message bits,** auxiliary data **corresponds to message bits)**

20. As to claim 4, Fridrich teaches comprising the steps of (**col.12 lines42-65, col.13 lines1-10, see the steps from step1 through step 5**)

(a) accommodating auxiliary data (**Fig.1: Embedding part, col.13 lines 1-7, the Flips Groups concatenate the message)** only in a segment of a given length (**Fig.1: Embedding part, col.13 lines 1-7 steps 4 -5, when the difference between the length of the compressed bit stream and the number of proceed coefficient is larger than the message M to be embedded,** the given length **corresponds to the difference between the two numbers)**

(b) accommodating, in a subsequent segment, restoration data only for the previous segment (**Fig.1: Embedding part, col. 12 lines 42-67, step1 through step 4, the output of Compress RS-vector is divided into B disjoint blocks ,where B is a total number of blocks, arranged in sequence, thus each blocks are compressed in non overlapping sequence before embedding the message,** the previous segment corresponds to the **k^{th} block, k=1,2,3…B)**

(c) adapting the length of said subsequent segment to the amount of restoration data being embedded therein (**Fig.1: Embedded part, col. 12 lines 64-67- col.13 lines 1-6 step 4, the Compress RS-Vector block stop compressing and concatenate the message when the difference between two length (see above) is larger than the message length,** given length corresponds to the difference between the two number

d) repeating steps (b) and (c) a predetermined number of times **(col. 12 lines 64-67, col.13 lines 1-12, step 3 and step 4, repeat step 3 and step 4 until all B blocks are**

processed, predetermined number of times corresponds B which is equal to the number of blocks **)**

21. As to claim 5, **Fridrich teaches** said step (d) comprises repeating steps (b) and (c) until the length of the subsequent segment is smaller than a predetermined threshold (**col.13 lines 1-2, repeat t step 4 until the difference length of the compressed bit stream C and the number of processed coefficients K larger than the message M to be embedded, thus the compression and embedding process is continuo until C< M+K,** the predetermined threshold corresponds to **M+K)**

Conclusion

The Prior art made of record

1. Brain Chen, "Design and Analysis of Digital Watermarking Information Embedding, and Data Hiding System", Ph. D Thesis, Massachusetts Institute of Technology, June 2000
2. US Patent Pub. No. 7,006,656 B2

The prior art made of record and not relied up on is considered pertinent to applicant's disclosure

1. US Patent No. 7,113,59
2. US Patent No. 6,778,678
3. US Patent No. 6,741,758
4. US Patent. No. 6,425,082
5. US Patent. No 7,159,177
6. US Patent. No 6,278,791
7. US Patent. No 7,277,468
8. Brian Chen, "Quantization Index Modulation: A Class of Provably Good Methods for Digital Watermarking and Information Embedding"2001 IEEE, Page 1423-1443

Any inquiry concerning this communication or earlier communication from the examiner should be directed to Mekonen Bekele whose telephone number is 571-270-3915. The examiner can normally be reached on Monday -Friday from 8:00AM to 5:50 PM Eastern Time.

If attempt to reach the examiner by telephone are unsuccessful, the examiner's supervisor Jingge Wu can be reached on (703) 308-9588. The fax phone number for the organization where the application or proceeding is assigned is 571-237-8300. Information regarding the status of an application may be obtained from the patent Application Information Retrieval (PAIR) system. Status information for published application may be obtained from either Private PAIR or Public PAIR.

Status information for unpublished application is available through Privet PAIR only.

For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have question on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866.217-919 (tool-free)

/Jingge Wu/

Supervisory Patent Examiner, Art Unit 2624